

Assessing the Impact of Interactive Language Learning Tools on Student Engagement: A Critical Pedagogy Perspective Over Elementary Level Students of One Class

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Abstract

Humans are efficient language learners and inherently social creatures. Our language development is largely shaped by our social interactions, for example, the demonstration and feedback from caregivers. Contrary to human language learning, recent advancements in large language models have primarily adopted a non-interactive training paradigm, and refined pre-trained models through feedback afterward. The use of learning methods plays an important role and receives special attentions for a learner's life. We live in digital era, where everyone wants something efficient, effective, dynamic, fast and interactive. The term 'interactive' appears in two distinct strands of educational research discourse: one concerning pedagogy and the other concerning new technologies in education. Teaching learners with traditional method where there is only one way of communication is no longer effective. The word 'interactive' is the key to have an effective and efficient teaching and learning process where the teacher can grab learners' attention and learners can learn more in comparison to that of the traditional method. Traditionally, most of the learners have been acquiring information and knowledge through less involvement of learners whereby learners only sit and listen to the unfaltering lectures. In addition, learners will copy down the endless indescribable notes that have been written on the whiteboard. The aim of the research was to determine the effect of using an interactive notebook on the learning and memory of seventh grade students in District 2 of Tehran. The current research is applied in terms of purpose and semi-experimental. The statistical population of this research included all secondary school students of the first period (first grade) of District 2 of Tehran. From this society, 60 students were randomly selected and randomly divided into two experimental and control groups. The experimental group used an interactive notebook, but the control group followed the usual form of learning. Research tools included pre-test, post-test (learning test) and follow-up (remembering test). The obtained data were analyzed by covariance analysis. The findings of the covariance analysis showed that the use of interactive notebooks can be effective on the learning and memorization of secondary school students in the first period of district 2 of Tehran (0.001). According to the findings, one of the effective teaching methods on learning and memorizing course materials is the use of interactive notebooks by students.

Key words: Interactive notebook, learning, memory, students, seventh grade.

Introduction

Since the past century and with the emergence of specialized fields of educational sciences and educational psychology, the study of students' academic progress and factors related to it forms a prominent part of the researches of specialists in these two fields (Yasminejad, Taheri, Golmohammadi and Ahadi, 1392). The review of previous studies shows that the difference in the academic progress of students is subject to several factors and this difference is not only subject to educational factors, but also influenced by psychological characteristics, learning methods and life experiences of students (Boroujerdi, Yunsi, Seyed Salehi and Asadpour, 2016).

Academic life is one of the most important aspects of students' lives, which has a great impact on other aspects of their lives (Qorbani Qahfarkhi, Islamic and Kaysari, 1396). One of the important components in relation to academic life is learning. One of the important characteristics of humans is the ability to learn. Growth in different aspects, progress and civilization, dealing with crises and achieving complex technologies, adaptability and psychological health, are the result of his efforts to learn and gain experience. Learning is one of the most important issues of psychology, which has forced theorists in various fields, including learning psychology and educational psychology, to research the factors of its formation, facilitation, continuity and stability (Hunter and Linder, 2010). Education and learning and study skills are also considered as learning shaping measures (Berthold, Nuckles and Rinkel, 2010).

Another component to consider in connection with the academic life of students is memory. By reviewing the history of education, we find that education and memorization is one of the main concerns of education specialists. The main problem of students is that in most cases, they retain information due to repetition and practice, without realizing their connection with the material they have already learned; Therefore, their learning is parrot-like and less durable. As the world we live in becomes more complex, the need to create deep and sustainable learning becomes more noticeable and obvious. Nowadays, education cannot be limited to rote learning (Samiei and Irvani Menesh, 2015).

Suigur and Yaratan (2011) have mentioned in the result of their research that one of the factors that have led to serious problems in memorizing math lessons is inappropriate learning-memorization. Also, Yip (2007) believes that failure in study and learning skills can negatively affect all the other advantages of a favorable educational environment and even the intelligence capabilities and physical and mental health of people. And on the other hand, if it is effective, it can adjust or compensate for many possible inadequacies in educational environments and even deficiencies in academic motivation. In addition, the teaching of study and learning skills has been able to increase the academic motivation of students. Therefore, addressing the efficient method in order to improve students' learning and memorization is the main issue of this research. Researches have been carried out in order to determine the reasons for the lack of academic progress of students and the results

have shown that one of the factors affecting the learning and academic progress of students is the quality of education and the way the lessons are presented (Mishael, 2016).

Educational methods can be placed in two categories; One is the teacher-centered or direct teaching method and the other is the learner-centered or indirect teaching method. Teacher-centered education means education in which teaching and learning activities are mainly directed by the teacher. In this method, the teacher is the provider of the content and the learner is the recipient of the content. Learner-centered education means education in which learners, with the help of the teacher, take responsibility for understanding the material. Learner-centered education is rooted in the constructivist psychology approach. The theory of constructivism emphasizes the creation and design of learning environments. Environments that are student-centered, collaborative, based on original assignments and contextual evaluation, and are consistent with the concepts of situational awareness, connected learning, cognitive flexibility, and cognitive discipleship (Seif, 1394).

This approach, which has received the attention of education professionals in the present era, does not consider learning in a linear way. Rather, they see learning as integrated and at the same time complex, which causes the mental activity of learners. In the constructivist classroom, learners develop their own learning, invent and, of course, creatively solve the problems they encounter in learning (Yasblaghi et al., 2015).

In various researches, researchers have investigated different methods in improving students' learning and memorization. Among them, Ghamin and Norouzi (1390) investigated the impact of multimedia on learning and memorization of Persian lessons in a research. The results of the research indicate an increase in learning and memorization of tomology, hand-eye coordination skills, and recognition of the shape of the board compared to the control group. Yasblaghi et al. (2015) showed in a research that the learning and memorization rate of students who were trained with the Bayibi teaching method is higher than the students who were trained in the traditional way. Also, in a research, Emadi and Zanjani showed that the students who were trained with the combined method had higher learning and memorization in the spatial geometry course compared to the students who were trained with the conventional method.

As seen, various researches have studied different educational methods and contradictory results have been produced and there is no optimal and stable solution in this field. In the meantime, one of the new tools and methods to improve students' learning and memorization is the interactive notebook. The interactive notebook is a wired notebook (for ease of typing) in which the right and left pages are defined. The right or input pages contain what the teacher conveys to the students, such as educational content, classroom pamphlets. In general, all the content that is necessary for the final evaluation is included on the right side of the interactive notebook and is a reference for the students. The student is responsible for the pages on the left side (exit) of the notebook. In the pages on the left side, the student records his/her take from the lesson and the content presented on the right side,

in the form of a lesson summary, concept map, drawing and illustration, table, diagram, graphic design, painting, etc.

Using an interactive office is effective in increasing writing and reading skills. The interactive office can present the views previously learned and developed as academic progress in the academic year. Finally, interactive notebooks are used as a method to increase student achievement (Rossi, 2004). The use of inquiry-based instruction in conjunction with an interactive science office enables students to collect data and analyze data in ways similar to real scientists (Wist, 2006; Maracarelli, 2010).

Timely feedback enables correcting of mistakes and better learning. This makes the interactive notebook a powerful educational tool, especially when combined with metacognitive strategies (Hetty, 1992; Sievert, 2011; Maracarelli, 2010). Rossi (2004) found that using interactive science notebooks is a flexible tool that enables students to think, show creativity, and even acquire much-needed skills for success in science.

In addition, Aschbacher (2004) in his study on the interactive scientific office tool pointed out that the interactive office can be an effective tool for measuring student achievement in "real time"; They still claim that students don't understand a concept is fully introduced as soon as possible. In fact, they provide a window into students' emerging concepts. The practice of using the interactive notebook is one of those things that teachers can look at as a glimpse to remind students. Haji Salem (2017) in a research entitled the effect of using different note-taking strategies on better understanding of listening skills for advanced level learners of English, showed that students who, in addition to listening to the material, also took notes on those materials, Compared to students who only listened, they performed better in understanding listening skills.

Abbasi and Azarbakhsh (2016) conducted a research titled the effect of concept map on learning biology. This research was conducted with the aim of determining the effect of the concept map teaching method on the learning rate of the biology course, especially in the direction of meaningful learning. The statistical population consisted of: all the students of the third year of high school of experimental sciences in Kohgiluyeh and Boyer Ahmad provinces who were studying in the academic year 2016-2016. For selection, a sample of 40 people was selected in a purposeful way. Half of the people in the experimental group and the other half in the comparison group were replaced. The effects of applications on the cognitive performance of learners were measured through the academic achievement test, which had acceptable validity and reliability indicators. The method of this research was based on a semi-experimental design with pre-test and post-test. In this research, the classrooms that were formed in advance were selected as the experimental group and the comparison group by purposive sampling method. In the experimental group, conceptual maps were prepared in advance and presented to the subjects in the class process. The findings of the present research show that, in general, the use of concept maps as a teaching and learning strategy has a positive effect on the learning of biology lessons as well as meaningful learning.

Nazari and Sheikhi (2015) conducted a research titled the effect of concept map strategy on improving students' learning. The present study was conducted in order to investigate the effect of concept map strategy on improving the learning of cognitive goals of high levels of Bloom's taxonomy in middle school biology course. The statistical population in this research is the third-year male students of Abdanan secondary school in the academic year 2013-2014, and the sample studied in this research was two classes of 22 people which were selected based on multi-stage cluster random sampling and were randomly assigned to two experimental and control groups. The tool used in this research was the biology test. In order to analyze the data, one-way analysis of covariance was used. The research design was of quasi-experimental type with pre-test and post-test with the control group, after random selection of experimental and control groups, the experimental intervention (concept map strategy) was implemented on the experimental group for 8 sessions of 90 minutes and twice a week. After completing the training program, both groups were given a post-test. The results of covariance analysis showed that the use of concept map strategy is effective in improving the learning of the cognitive goals of the high levels of Bloom's classification in the biology course. Therefore, since the use of the concept map strategy improves the learning of lessons with multiple concepts, it is necessary that the trainers and those involved in education become familiar with what and how to use this effective strategy.

Ali et al. (2013) conducted a research to determine the effectiveness of teaching based on written assignments on the level of learning and reflective thinking of students. Teaching based on written assignments was implemented as an independent variable in two levels of short written assignments and analytical essay writing. Using the design of unequal groups with pre-test and post-test, 221 undergraduate students of Educational Sciences of Farhangian Amirkabir University of Karaj were randomly assigned to 1 group: Experimental group 2 (short written assignments), experimental group 1 (analytical essay writing), and control group (traditional education). The results of covariance and variance analysis on the data obtained from the implementation of the research tools (academic achievement test and reflective thinking questionnaire) in the two stages of pre-test and post-test, which were conducted before and after the presentation of 26 training sessions, showed:

The average learning score of the students of the two writing groups was higher than that of the traditional education group in all learning levels except the memorization level, and the average of the essay writing group was higher than the short homework group in the application level. The average reflective thinking score of the students of the two writing groups was also higher than the traditional education group in the levels of comprehension and understanding, thinking on action, and critical thinking, and the average score of the essay writing group was higher than the short assignments group in the levels of thinking on action and critical thinking. Overall, these findings confirmed the effectiveness of writing-based education on improving the level of learning and reflective thinking of students and showed that analytical essay writing is more effective than short assignments.

Rosta (2013) in a research titled investigating the relationship between writing components and the learning of spelling skills of second grade elementary students with the statistical population including second grade elementary students in Shiraz who were studying in the academic year of 2012-2013. It showed that the teaching of writing components (based on the predicted method) has an effect on the students' spelling development skills.

Sharifi (2019) in a research entitled the effect of note-taking skills training on the motivation to progress in learning and academic self-efficacy of students of Shahid Bahonar University and Kerman University of Medical Sciences. They showed that the motivation to progress in learning and the academic self-efficacy of the experimental group students increased significantly after the note-taking skills training. Therefore, it is necessary for those involved in education to invest more in promoting note-taking skills training.

Wilson (2015) conducted a research on the use of interactive office and students' learning rate. The method of this research was qualitative. The statistical population was teenage students in California. who selected 46 students by simple random method. The purpose of this research is to increase the learning of students who have less ability to improve their reading and writing ability. Data collection has also been done through interviews. The results of this research showed that the interactive office encourages students to be more involved in the learning process.

Jaladanki (2014) conducted a research on the role of learning based on interactive office teaching. This research was conducted using a qualitative method. The statistical population was high school students in physics. A statistical sample of 30 students was purposefully selected from high schools in Texas. Data collection included several methods such as interviews, participant observations and document analysis. To reduce and manage the data from the descriptive method, Labovitch's six-part model of narrative programming was used. The codes were divided into eight categories. Two main themes were identified from the data analysis: interactive notebooks – evidence of constructive learning and interactive notes – a pioneering method in education. The findings of this study provide scientific education and qualitative research and create space for free, independent and constructive learning of scientific principles. In addition, the findings provide findings related to the transferable aspects of individual learning processes for each part of education where the concepts are challenging for students.

In his research, Kibar (2013) evaluated the understanding of chemistry students (future chemistry teachers) from the quantitative and qualitative analysis of their concept maps. Using the technique of concept maps as a means to measure the meaningful learning of students was the focus of this study. This study was conducted on 64 final year students (22 years old) (11 men and 13 women) in the Chemistry Department of KTU University in Turkey. This study was designed to evaluate and investigate chemistry students' learning of gas concepts using concept maps. In this study, students were asked to use the word "gas" at the top and center of the page, and they were given 19 other words that they could relate to

the concept of gases. Students could use any of these words or all of these words or related words.

Although the participants in the chemistry teaching method unit were familiar with the concept map drawing method, A two-hour session was planned for the students so that the main components of drawing a concept map such as concepts, propositions, hierarchies, cross-connections and examples will be presented to them in a summary form. And they also learned how to draw a hierarchical conceptual map before drawing. Then the students were asked to draw their meaning map using the given words. They were told that they could use prepositional words related to the concepts of gases and that they did not have to use all the given words. Students had problems with drawing hierarchical conceptual maps and expressing meaningful propositions between concepts. So, in another two-hour class, they were taught how to draw non-hierarchical concept maps and asked to draw new maps. This time, students were free to draw a hierarchical or non-hierarchical map. At the end of these two training sessions (four hours), the students drew their final maps and these maps were considered for analysis and review. In fact, the data is obtained from the students' latest conceptual maps. In this study, it was found that the use of concept maps as a method to evaluate students' conceptual learning is very useful.

Fulton (2012) conducted a research on the use of interactive office in the classroom. The research method was qualitative. The statistical population included high school teachers. A statistical sample of 57 people was selected using a simple random method. Data collection was also done through interviews. The results showed that before using the interactive office in the classroom, most teachers rely on various methods such as lectures, notes, videos and other activities. It is just as important for students to discover and create in a meaningful way, as it is for teachers to remember and write in structures that provide meaningful connections to the subject. It is important that students understand with perseverance and excitement.

Wilkins (2009) conducted a study on the effect of using an interactive notebook in learning science lessons. The research method was a semi-experimental pre-test-post-test type with a control group. The statistical population included male and female middle school students. Among this community, 19 eighth grade students (8 girls and 11 boys) were purposefully selected. These people had obtained an average score in the government standard test. The interactive notebook used in this research was a wire notebook that students were not allowed to remove a page from. The results showed that the students had significantly mastered the science lesson after using the interactive office. This research showed that this notebook can reveal the students' thoughts and help the teacher to understand the students' views.

Duschel (2007) conducted a research titled the role of writing in learning. The research method was qualitative. The statistical population included primary and secondary school students. From this community, 160 people were selected based on available sampling. Their information was collected based on semi-structured interviews. Their results showed

that according to the amount of focus on students' metacognition, students cannot recognize their memory limitations. Most students feel that writing information is an unimportant task, however, students' use of interactive scientific notebooks can encourage students to work hard to retain their information.

Rossi (2004) conducted a research on the effectiveness of the interactive notebook as a successful tool in the classroom. The research method was semi-experimental with pre-test and post-test with the control group. The statistical population included elementary school students in Arlington, Texas. The statistical sample included 22 students (15 girls and 7 boys) in the fifth grade in a public elementary school in Arlington, Texas, using cluster random sampling. used the test of attitudes related to science to evaluate the scientific attitude of students, which follows 5 scales:

1) social consequences of science, 2) habit of scientists, 3) attitude towards scientific research, 4) acceptance of scientific attitudes, and 5) enjoyment of scientific lessons, leisure interest in science and career interest in basic sciences. Each student used a medium-sized notebook as an interactive notebook during 12 weeks and at least 4 times a week. The results of the research showed that interactive notebooks are flexible tools that give students the opportunity to think, show creativity and even practice the necessary skills to succeed in it. The strength of thinking skills such as problem solving and critical analysis increases, and students, parents, and teachers can meaningfully see progress. All students had a positive attitude towards the interactive office and were willing to use it again. It helps teachers to facilitate the teaching and learning process.

Mather (2004) conducted a study on the effect of teaching note-taking and reading comprehension strategies in high school. The research method was a semi-experimental pre-test-post-test type with a control group. The statistical population included middle school students. 40 students of the first and second grades of middle school were selected by simple random sampling (lottery) and were randomly replaced in two experimental (20 people) and control (20 people) groups. The results showed that the teaching of these strategies has resulted in positive changes in the way of taking notes and understanding the text book and as a result, the learning rate of the students of the experimental group. In this regard, according to the review of all theses and written literature of management and the list of theses available in faculties and centers of scientific and research documents, Specific research has not been observed regarding the impact of the use of interactive notebooks on students' learning and memorization across the country, and according to the above, the researcher in the present study generally seeks to answer this issue Does the use of interactive notebooks have a positive effect on students' learning and memory?

Research methodology

The current research is applied in terms of purpose and semi-experimental. And the pre-test-post-test research plan has been used along with the control group.

The statistical population of this research included the students of the first year of high school in the 2nd district of Tehran in the academic year of 2017-2018. In order to select the statistical sample size, available sampling method has been used. It should be noted that there were 120 students of the first secondary level in the state model high school of 9th. Of these, 60 seventh grade students participated in the present study with written consent. Then 60 people were randomly divided into two experimental (30 people) and control (30 people) groups.

The experimental group used the interactive office during the training period. At the same time, the control group learned the same material, but did not use the interactive notebook. Every day they were given similar training and activities. Then, at the end of the course, a standard evaluation test was taken from both the test and control groups.

In order to collect information, three tests including pre-test, post-test and follow-up were used. The pre-test included the students' end-of-semester exam. which is designed in descriptive form and with 20 questions by the teacher. The formal and content validity of the questions has also been confirmed by the educational group. Also, the reliability of this tool using Cronbach's alpha method is equal to 0.81.

The post-test (learning test) is used to evaluate the students' learning in the post-test. This test was prepared parallel to the pre-test in terms of difficulty and clean factor. The follow-up test (remembering test) included the same post-test questions that were administered to the students 3 weeks later.

In order to check the validity and reliability of the tests, content validity method and Cronbach's alpha were used. The content validity of the test was confirmed by 3 experienced teachers and using the parallel forms method, Cronbach's alpha was obtained with a value of 0.81, which confirms the reliability of the research tool. The test used in the memory is parallel to the post-test (with the approval of the mentioned experts) and the psychometric characteristics of its questions were equivalent to the post-test.

Statistical analysis has been performed at two descriptive and inferential levels. At the descriptive level, to measure the research variables and demographic variables, the measures of tendency to the center (mean) and the measures of dispersion from the center (standard deviation) were used. A graph was used to display the data according to the measurement scales.

At the inferential level, the Kolmogorov-Smirnov test was used for the normality of the sampling distribution. Levine's test was used for homogeneity of variance between the studied groups. Also, covariance analysis was used to test the hypotheses. It should be noted that all these cases were done using SPSS version 24 statistical software and Excel 2010 software.

Findings

Covariance analysis has been used to answer the research hypotheses. This test is a statistical method that allows to examine the effect of the independent variable on the dependent variable; while removing or eliminating the effect of another variable. It does all these things at the same time. Therefore, it can check the difference between different levels of a dependent variable and also measure their difference in a new combination of several dependent variables. Before running covariance analysis, it is necessary to check the following items.

The normality of the multivariate data distribution was determined using the Kolmogorov-Smirnov test. Considering that the significance level obtained for all three tests is greater than 0.01.

Lune's test was also performed to check homogeneity. According to the results of Lon's test, the value of Lon's F statistic is not significant, the equality of variances of the dependent variables is established and it is possible to perform the covariance test. The first hypothesis is that use has a positive effect. Covariance test was used to investigate the effect of using interactive office on the learning of 7th grade students.

Table 1- The effect of using the interactive office on the learning of seventh grade students

Sources of changes	The sum of the squares SS	Degree of freedom df	Mean squared MS	F	Meaningful level	Effect size η^2
Reminder	1755.199	1	1755.199	89.112	0.001	0.866
Error	477.113	25	19..08			
Total	2232.312	30				

According to the results of Table 1, the use of the interactive notebook has been effective ($P < 0.01$) The square of the parabola of Eta shows the intensity of this effect (0.866). The significance of the effect indicates that the use of the interactive office has been able to increase learning in the subjects. The covariance test was also used to investigate the effect of using the interactive office on the memory of seventh grade students.

Table 2- The effect of the interactive office on the memory of seventh grade students

Sources of changes	The sum of the squares SS	Degree of freedom df	Mean squared MS	F	Meaningful level	Effect size η^2

Reminder	966.222	1	966.222	180.132	0.001	0.802
Error	156.221	25	6..248			
Total	1122.443	30				

According to the results of Table 2, the use of the interactive notebook has been effective $F(1, 25) = 180/132$ ($P < 0.01$); The square of the parabola shows the intensity of this effect (0.802). The significance of the effect indicates that the use of the interactive notebook has been able to increase memory in the subjects.

Conclusion

The impact of using interactive office on learning was investigated using covariance analysis. The results showed that there is a significant difference between the average post-test scores of the experimental group and the post-test of the control group, after the evidence of the initial differences in the pre-test in the learning rate. Therefore, there is no reason to confirm the null hypothesis and it is rejected, and the researcher's hypothesis that the significance of the use of interactive office on students' learning is confirmed.

This finding is implicitly aligned with the results of Haji Salem (2017), Aali et al. (2013), Wilson (2015), Jaladanki (2014), Kibar (2013), Dushel (2007) and Mater (2004). In their studies, they showed that one of the effective factors in learning lessons and educational materials among learners, especially students, is the use of notebooks and note-taking. It should be noted that no research that contradicts the results of this research has been observed.

The effect of using an interactive notebook on memorization was also investigated using covariance analysis. The results showed that there is a significant difference between the average scores of the post-test of the experimental group and the post-test of the control group, after the evidence of the initial differences in the pre-test in the memorization level. Therefore, there is no reason to confirm the null hypothesis and it is rejected, and the researcher's hypothesis that the significance of the use of interactive notebooks on students' memory is confirmed.

This finding is implicit consistent with the results of the researches of Rusta (1393), Sharifi (1390), Nazari and Sheikhi (1395), Abbasi and Azarbakhsh (1396), Fulton (2012), Leffer (2011), Wilkins (2009) and Rossi (2004). In their studies, they showed that one of the effective factors on memorization and stability in the results of learning courses and educational materials among learners, especially students, is the use of a notebook and note taking. It should be noted that no research that contradicts the results of this research has been observed.

According to the findings of the research, it is concluded that the use of interactive office by students has influenced their learning and memorization. Therefore, in explaining the obtained results, we can refer to the constructivist learning theory.

The constructivist approach refers to the fact that knowledge is a constructive matter; This means that the learner creates new knowledge from the combination of his past knowledge and available information (including information, lecturers, books and practical experiences). If so, knowledge is constructed in a special and unique way.

Therefore, the active participation of the learner in teaching, the teacher's facilitating role in teaching versus the role of transmitting information, emphasis on practical situations and objective education and authentic experiences as components of education in teaching are important. These components exist in constructivism-based teaching.

Meanwhile, one of the concepts related to the theory of constructivism, which is the most important in education, is situational learning. This concept, which is also emphasized in constructivism, knowing, cannot be separated from doing work, and if this principle is not taken into account, knowledge is separated from its context. Followers of the constructivist view believe that cognition is situational. That is, knowledge depends on the situations, purposes and tasks in which it is used. In other words, any knowledge is dependent on the purposes and situations for which it was originally created. What students receive, think and compile,

It is basically under a context, that is why when learning is considered as a situational activity, it generally helps the process of making meaning and understanding of skills and concepts when they are used. This is why situational learning is basically an urgent need for the activities of schools and universities. In order to achieve situational awareness, the followers of constructivism theory suggest that; We need to encourage learners to learn by engaging in authentic and authentic tasks. Genuine assignments mean objective and practical life situations. The separation between knowing and doing in the real world has traditionally been overt in school learning. Schools have emphasized on learning basic principles, concepts and general facts and teaching them abstractly without considering the context. The inadequacy of this approach is abundantly seen in daily experiences.

Many of the abstract knowledge taught in schools cannot be found in real (daily) life; Because this approach ignores the dependence of position and knowledge. When learning and context are considered separately, learners consider knowledge itself as the end product of education. Instead, consider it as a dynamic tool to solve problems. In fact, the principles of learning as a constructive activity are based on the idea that learning happens daily in the form of problem solving and work. This means that the learner can achieve learning by engaging and actively interacting with the physical and social environment.

And therefore, according to this point of view, day by day, learning as the transfer of knowledge, which was the core of learning in traditional education, is progressing to more active learning and personal knowledge, skills and development of abilities.

And this is what constructivists emphasize. Therefore, one of the important features of the constructivist approach is situational learning, which can greatly transform the teaching and learning and memorization of students.

In the meantime, one of the methods based on the constructivist approach is the use of an interactive office. The teaching method based on the interactive office as an educational tool and strategy affecting the education process can be effective in motivating and guiding students' learning. The interactive notebook is an educational tool that provides students with the opportunity to record what they have learned and provides the possibility of preparing educational materials using a meaningful and reflective method based on their own perceptions. The purpose of using an interactive notebook is to help students organize and analyze the information they receive from the teacher in the classroom. This is achieved with educational strategies such as note-taking, conceptual mapping, and organizing and categorizing information in the form of an interactive notebook. This educational method is based on multiple intelligences and brain-based learning.

The interactive notebook is a wire notebook (for ease of typing) in which right and left pages are defined. The right or input pages contain what the teacher conveys to the students, such as educational content, classroom handouts, student notes from the teacher's teaching, and the results of group discussions. In general, all content required for the final assessment is included on the right side of the interactive notebook and is a reference for students. The student is responsible for the pages on the left side of the notebook. In the pages on the left, the student records his impression of the lesson and the content presented on the right, in the form of a lesson summary, concept map, figure drawing and illustration, table, diagram, graphic design, drawing, etc. In this way, a means is provided to establish a connection between the student's previous knowledge and new learning and to review and think and deepen perception. The student meaningfully puts what he thinks on these pages and shares it with his teacher, classmates and parents.

When students are required to write down what they think, they will be forced to clarify what they have learned and organize it on paper in a way that the audience can understand. To do the work, students are given time to discuss the key words and figure out how they relate to each other and how the content relates to the lesson objectives. The interactive notebook is a powerful tool that helps both the teacher and the student. In this method, the teacher makes an educational design for students to take notes. Notebook materials include diagrams, drawings and shapes, a variety of visual organizers, and even 3D elements or sections, all of which help students understand the material and gain the ability to compare and make connections between materials.

Also, this method helps students to become active and enthusiastic learners; Note down the contents purposefully and write their own conclusions and findings. In this way, they learn how to organize what they have learned, and since they write the material in their own language, the scientific material becomes their own, and they make learning personal and unique with their art and creativity. The interactive notebook encourages students to write as

they think, making them active learners. For example, in physics lesson, it is necessary for the teacher to make sure that the student has understood the scientific word or phrase in the context of his title or scientific concept, not based on his previous knowledge of this word. By using the interactive notebook in which the student writes his findings, it is possible to correct these misunderstandings. Therefore, it can be said that the use of interactive office by students has been able to improve and improve the level of learning and the stability and memorability of learning results in them in the educational environment.

Memorization is the ability to remember the read material after a period of time has passed. Therefore, the importance of this phenomenon is that the material read is the basis for the study of courses in the coming years. Since some courses are basic and prerequisites for other courses. Therefore, dealing with the memory phenomenon is one of the necessary and unavoidable components in schools by students.

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